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Spring 1955

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This paper describes the waterfowl and marsh bird migration, nesting use, and production of a small marsh north of St. Paul, Minnesota. The study reported was undertaken to record the biological phenology of a potiole, special reference being given to bird migration and nesting. In its original form the report included data collected on other vertebrate and invertebrate groups from the marsh as well as a nearby wooded area.

Field work was initiated on April 1 and continued through June 7. After May 15 field observations were confined to nesting studies whereas prior to that date migration phenologies were studied more intensively.

During the study a list of 65 bird species, both terrestrial and aquatic, was accumulated. Of these 65, a sufficient amount of nesting data for discussion was collected for four species. Migration patterns discussed herein include only those species observed within the perimeter of emergent vegetation. Dr. W. H. Marshall assisted in the preparation of this paper.

DESCRIPTION OF AREA

The study area consisted of a shallow pothole approximately 3.5 acres in extent. It was located three miles north of the University of Minnesota, St. Paul campus, at the intersection of Cleveland Avenue with county road C-2. The intersecting roads divided the area into three smaller ponds, each quite homogenous in regards to cover types (see figure). The study area was Pond V of Pospichal and Marshall (1951) who reported on certain Sora (*Porzana carolina*) and Virginia (*Rallus limicola*) Rail studies.

The small amount of existant emergent cover consisted of four stands of cattail (*Typha latifolia* and *T. angustifolia*) and river bulrush (*Scirpus fluviatilis*). Immediately in back of the emergents as well as along most of the shore was a dense growth of wetland grasses and forbs. A wooded ridge formed the eastern boundary of the study area and a pasture the western boundary.

Water depths as reported by Pospichal and Marshall (op. cit.) ranged up to four feet. Water levels remained nearly constant throughout the study except for a gradual recession in late May and a sharp rise to normal in early June.

WEATHER

The weather in the vicinity during the study period was excessively warm and dry, (Climatological Data, Minnesota, April 1955.) April, 1955 was the warmest in the past 40 years, above normal means occurring on 25 days. The average April daily mean was 54° F and for the first two weeks of May the average daily mean was 62° F.

Since 1930, only April, 1940 and 1952 were dryer, a deficiency from normal of one inch of total precipitation being recorded. Up to May 15 a deficency in precipitation of 1.1 inches had been recorded for the first half of that month.

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ARRIVAL AND DEPARTURE DATES

The first waterfowl to appear were Mallards (*Anas platyrhynchos*) noted on April 1. They remained throughout the study. On April 6, two pairs of Ringnecks (*Aythya collaris*) and two pairs of Lesser Scaup (*A. affinis*) were observed. By April 8 their numbers had increased to four and three pairs respectively. They departed from the ponds on April 22. One pair of Redheads (*A. americana*) frequented the study area from April 7 to 11. The first pair of Blue-winged Teal (*Anas discors*) were observed on April 18. Together with the Mallards this species constituted the only breeding ducks of the area.

One pair of Coots (*Fulica americana*) were found on April 11 but none were observed thereafter. The first Sora Rails were noted on May 12 and they remained evident until May 28. However, all records were of single individuals and there was no evidence of

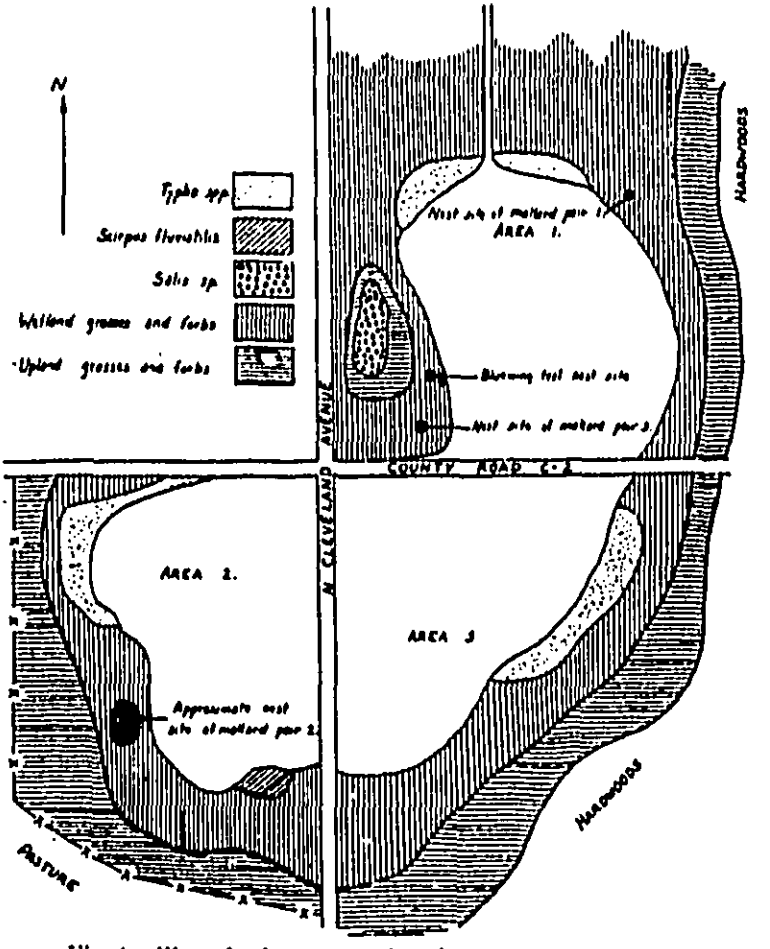

Fig. 1. Waterfowl nest sites in relation to cover types.

their nesting. Porpichal and Marshall (1954) reported rails nesting on the area in 1951 when there had been a more extensive and denser stand of emergent aquatics.

Great Blue Herons (*Ardea herodias*) were uncommon on the pond itself although numerous individuals in flight were observed throughout the study period. Green Herons (*Butorides virescens*) were very common, the first being noted on May 7. One American Bittern (*Botaurus lentiginosus*) was found on April 28 but this species was not discovered thereafter.

Killdeer (*Charadrius vociferous*) were very common during the entire study. They probably nested in some of the nearby fields. Wilson's Snipe (*Capella gallinago*) were observed from April 8 to the end of the month although none of their breeding activities were noted. A flock of Lesser Yellowlegs (*Totanus flavipes*) was noted on April 21 and on later dates an occasional individual of this species was found. Solitary Sandpipers (*Tringa solitaria*) were initially found on April 23 and they remained quite common thereafter. Black Terns (*Chlidonias niger*) first arrived on May 7 and became very common although they did not nest on the study area.

The first Kingfisher (*Megaceryle alcyon*) was found on April 18 and the first Short-billed Marsh Wren (*Astothorus platensis*) on May 12. The former species was uncommon and the latter was observed only twice.

Red-winged Blackbirds (*Agelaius phoeniceus*) were present when the study began. Yellow-headed Blackbirds (*Xanthocephalus xanthocephalus*) were first found on April 12. Though the latter nested on nearby water areas, all records were of occasional individuals.

MATING AND NESTING ACTIVITIES

Mallards — The first breeding pair of Mallards arrived on April 3 and by April 5 an additional two pairs had joined them. No courtship activities were noted and it was assumed that the pairs had mated prior to their arrival.

Territories were immediately established, one on each third of the pothole. Each of the defended territories included cattail growths and one or more muskrat houses. At this early date, however, little animosity was noted when one pair encroached upon another's territory. It appeared that territories were not as vigorously defended soon after their establishment as they were to be later.

Loafing sites, in all three cases muskrat houses, had been selected and were being utilized by the respective pairs by April 8. The same sites were occupied by the drakes for a considerable period of time after they had ceased to defend their territories.

Evidence of intensive territorial defense was first noted on April 10. On this occasion the pair from Area 2 was flushed by the observer onto the territory of Pair 3. The resident drake immediately directed a vigorous attack on the intruding drake, pursuing him on the water. After a series of short, quick flights they both took to the air. Until then the hens showed no special activity but the intruding hen then joined the flight. The resident hen began quacking loudly while the pursuit covered a wide circle. When the three airborne ducks were off the defended territory the resident drake gave up the chase. The hen finally gave up her noise making as her mate splashed in beside her. The whole exhibition of defense and flight lasted three minutes. On April 11 the same general pattern of defense was noted when Pair 3 was flushed onto the territory of Pair 1. By April 13 the pairs had become more attached to their territories as they were very difficult to flush from the water.

Territorial occupancy remained static until April 20 when two drakes were found feeding together on the established territory of Pair 1. The female of this pair was not evident. After this date the females of Pairs 2 and 3 were likewise not seen. Though the drakes con-

tinued to utilize the loafing sites, it appeared that they ceased to defend their territories about April 20. By June 1 all Mallard drakes had deserted the study area though a nearby marsh held a high population of them.

On April 21 a nest, containing five eggs, was discovered on Area 1 and by April 28 it held ten eggs. It was assumed that this hen began laying and incubation on April 16 and 26 respectively. The nest was well concealed in a clump of Reed Canary Grass (*Phalaris arundinacea*) located 20 feet from water. The nest hatched successfully between May 20 and 22 and by June 7 nine young had survived

No nest was discovered on Area 2 although a hen was flushed from the uplands adjoining Area 2 on two occasions. On May 17 a brood of 11 newly hatched ducklings, which were taken to represent this nest, was found on Area 2.

On May 12 a nest containing a complete clutch of eleven eggs plus one pheasant egg (infertile) was found on Area 1. This was thought to be the nest of Pair 3 as the hen, when flushed, joined the male in Area 3. It was poorly concealed in low grass, and was about 35 feet from water. This hen probably began laying April 21 and incubating May 3. The nest hatched successfully on May 30 and on June 7 all 11 still survived.

On June 7 a total of 36 Mallard ducklings were present on the study area. One brood of five had evidently moved in from a nearby area. On June 22 a total of 33 ducklings was counted.

Blue-winged Teal — The first breeding pair of this species was noted on April 12. Although they frequented the study area they did seem to have an established territory. By April 23 six pairs of teal were regularly found on the pothole.

It was extremely difficult to delineate the territories of this species as two pairs were often observed in close association. In no instance was territorial display as vigorous as that exhibited by the mallards. Often when one pair approached another too closely the only response observed was a series of head bobs accompanied by a high pitched whistle. Loafing sites included the shoreline, mud bars, and muskrat houses.

One teal nest with a sparse lining of down was discovered on May 17 when it contained five eggs. It was located on Area 1 in a clump of Reed Canary Grass about 25 feet from water. On May 22 the clutch was complete at nine eggs which were still being incubated on June 7. This hen probably began laying and incubation on May 12 and 21 respectively.

By June 7, broods of eight and ten teal ducklings were present. On June 22 a total of 38 teal ducklings were counted in four broods of eight, nine, ten, and 11.

Pied-billed Grebe — The first Pied-billed Grebe was heard calling on April 13 and by April 15 pairs were located on Areas 1 and 3.

Two nests were discovered. Both were placed about ten feet from emergent cattail cover over eight to ten inches of water. The nest on Area 1 contained seven eggs, one of which hatched on May 31. By June 2, however, no young were noted and examination of the nest showed that it had been badly torn up, the possibility existing that the chicks had been destroyed before they left the nest. The nest on Area 3 held eight eggs which had remained unhatched up to June 7. On June 22, four young grebes were counted on Area 3 and none on Area 1.

Red-winged Blackbird — Males of this species were noted singing from old cattail stalks when the study began on April 1. By April 11 their singing had increased in intensity, indicating that territories had been established by that date.

The females arrived on April 18 and after April 21 were seldom observed

without the company of a male. At that time territorial displays were very frequent and often involved both sexes. On April 21, flocks of females were noted in the uplands and along the roads but since they seemed to take no interest in the activities going on in the marsh they were taken to represent migrant individuals.

The first two nests were found on May 7, both of which were in the process of construction and contained no eggs. The first complete clutch of four eggs was discovered on May 12. By May 15 11 nests had been located, four of which held complete clutches. One of these nests contained two Cowbird (*Molothrus ater*) eggs.

All nests were located in cattail stands except one which was in a stand of River Bulrush. In six of the nests new cattail shoots were utilized as a supportive element, the growth of which often caused a partial tipping of the nests. The height of the nests above water averaged two feet while the distances between them were quite variable.

We believed that some marauding individuals had visited the area sometime between May 17 and 24 as on the latter date eggs from all five of the nests on Area 3 were missing. Two nests on Area 2 and one on Area 1 were likewise devoid of eggs.

On June 2 the first fledged young of this species were noted, two of which were found dead along the road. It was not possible to ascertain which nest these individuals were from.

DISCUSSION

There being few means available, a direct comparison with previous years of migration and nesting dates presented herein is not possible. It might be surmised, however, that due to the excessively warm spring weather both phenologies were somewhat advanced.

The patterns of spring arrival and resumption of nesting activities for the Red-wing Blackbirds presented, compare favorably to those described by Beer and Tibbitts (1950) reporting on their study of certain cattail marshes in the vicinity of Madison, Wisconsin.

A more objective comparison can be drawn as regards between the study area's 1955 productivity with the productivity of other years and other areas.

Sora Rails, Coots, and Yellow-headed Blackbirds did not utilize the area for nesting during the past season. The scant emergent cover was undoubtedly a factor contributing to the absence of these species, all of which had been previously reported nesting on the area. (Pospichal and Marshall, 1954). This situation may also have rendered the Red-winged Blackbird nests more obvious and facilitated the subsequent removal of eggs.

Surface feeding waterfowl, which do not require such extensive stands of emergent aquatics, appeared to have a high degree of nesting success particularly in view of the pothole being located within a suburban area. All three mallard territorial pairs were known to have brought off a brood. The teal did not present such a clear cut picture of production although the ponds supported four broods at the study's termination. Since one brood of mallards had almost surely moved in from another area, the probability that such movements might have occurred among teal broods was quite high.

A total of 60 ducklings of both species in varying age classes was counted on June 22. Since the pothole consisted of 3.5 acres of open water, its productivity becomes immediately evident. This figure compares favorably with the 63 young per five acres cited by Marshall (1952) as the 1947 production of three prairie potholes located in the vicinity. The possibility, however, exists that both these two figures represent production in years when conditions were near optimum for waterfowl nesting on these particular areas. Nevertheless, the significance of such small marshes in waterfowl production is clearly demonstrated by these data.

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